

**U.S. Environmental Protection Agency
Underground Injection Control Program**

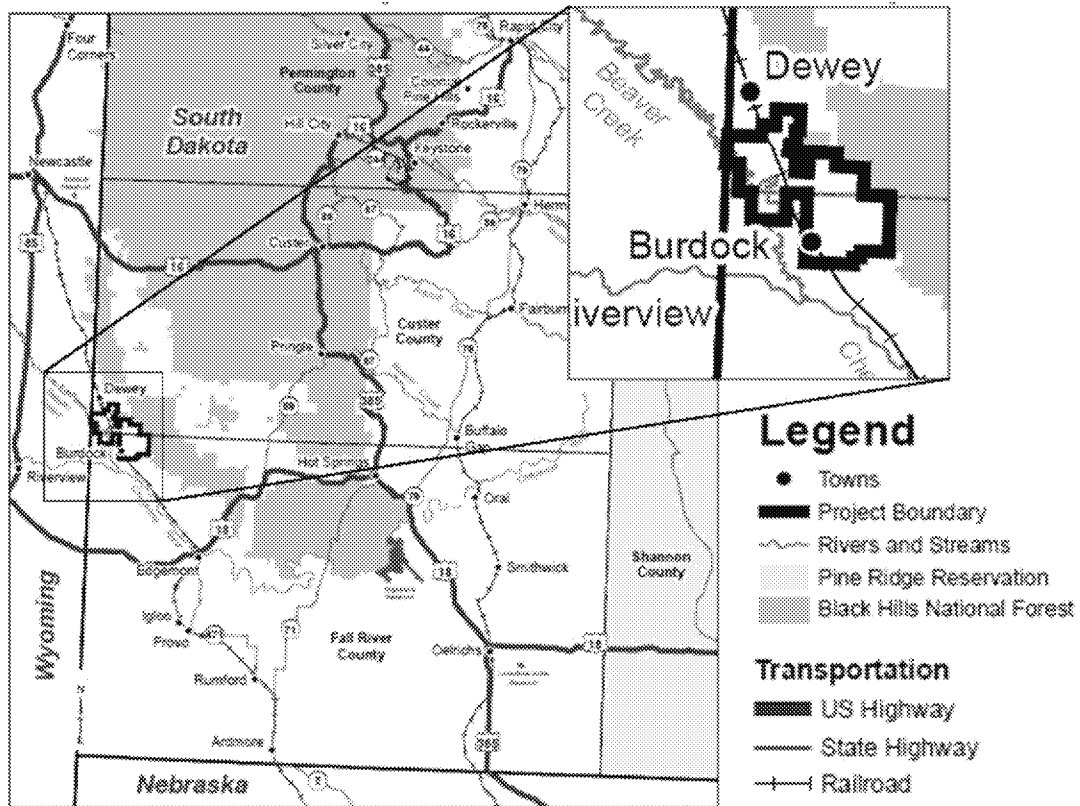
EPA Session:

***Information on the Dewey-Burdock Uranium Site
near Edgemont, South Dakota***

***Prepared for: The Santee Sioux Tribe
February 19, 2016 Webinar***



Dewey-Burdock Location Map



The Dewey Burdock site is located in the SW corner of Custer County and the NW corner of Fall River County on the Wyoming/South Dakota border. In the southern Black Hills. About 45 miles west of the Pine Ridge Reservation. Very close to Cheyenne River which is a concern for Oglala Sioux and Cheyenne River Sioux Tribes since the Cheyenne River borders their reservations.

EPA Dewey-Burdock Permit Process

▪ EPA's Role

- Underground Injection Control (UIC) Program & Regulatory Mission
- UIC Permits

▪ UIC Permitting Process

- Technical Analysis
- Tribal Consultation
- Draft Permits
- Public Participation Process

▪ EPA Outreach

- Public Hearings in SD
- Additional Tribal Community Outreach
- Continuing Tribal Consultation

EPA Dewey-Burdock Permit Process: Tribal Consultation

EPA's Policy is to consult on a government-to-government basis with federally recognized tribal governments when EPA actions and decisions may affect tribal interests.

The EPA views Consultation as a process of meaningful communication and coordination between EPA and tribal officials prior to EPA taking actions or implementing decisions that may affect tribes.

Current EPA Tribal Consultation Actions to Date and Plan for next steps:

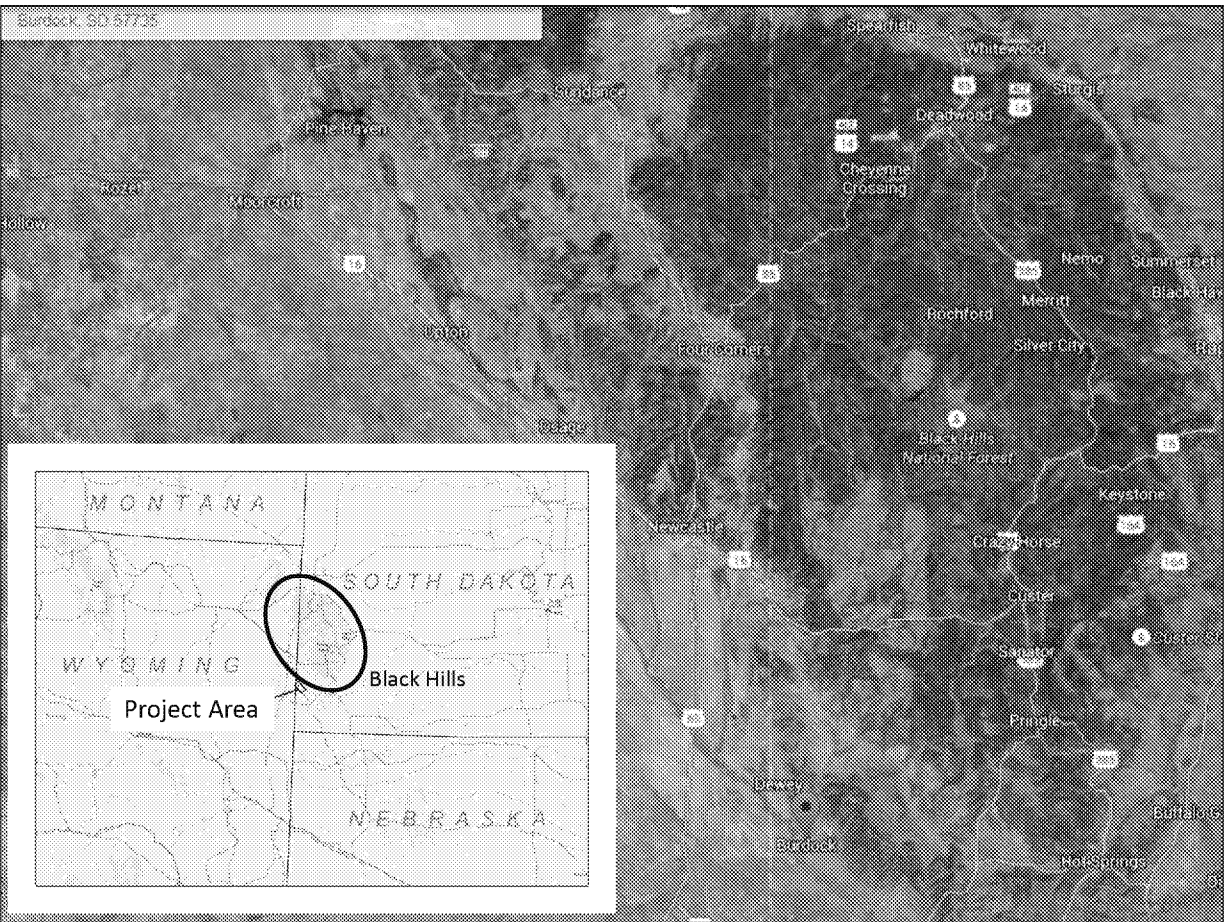
- Informational meetings with all Tribes with possible interest in site.
- "Inform & Educate" sessions to provide background information and opportunity for questions and discussion.
- Letters mailed November 25, 2015 providing notification of opportunity for formal consultation with EPA
- Receive back from Tribes notification of interest in formal government to government consultation with the EPA about the site.
- Formal Consultation opportunities before issuance of any draft permit decisions.
- Continuing consultation throughout the permitting process.

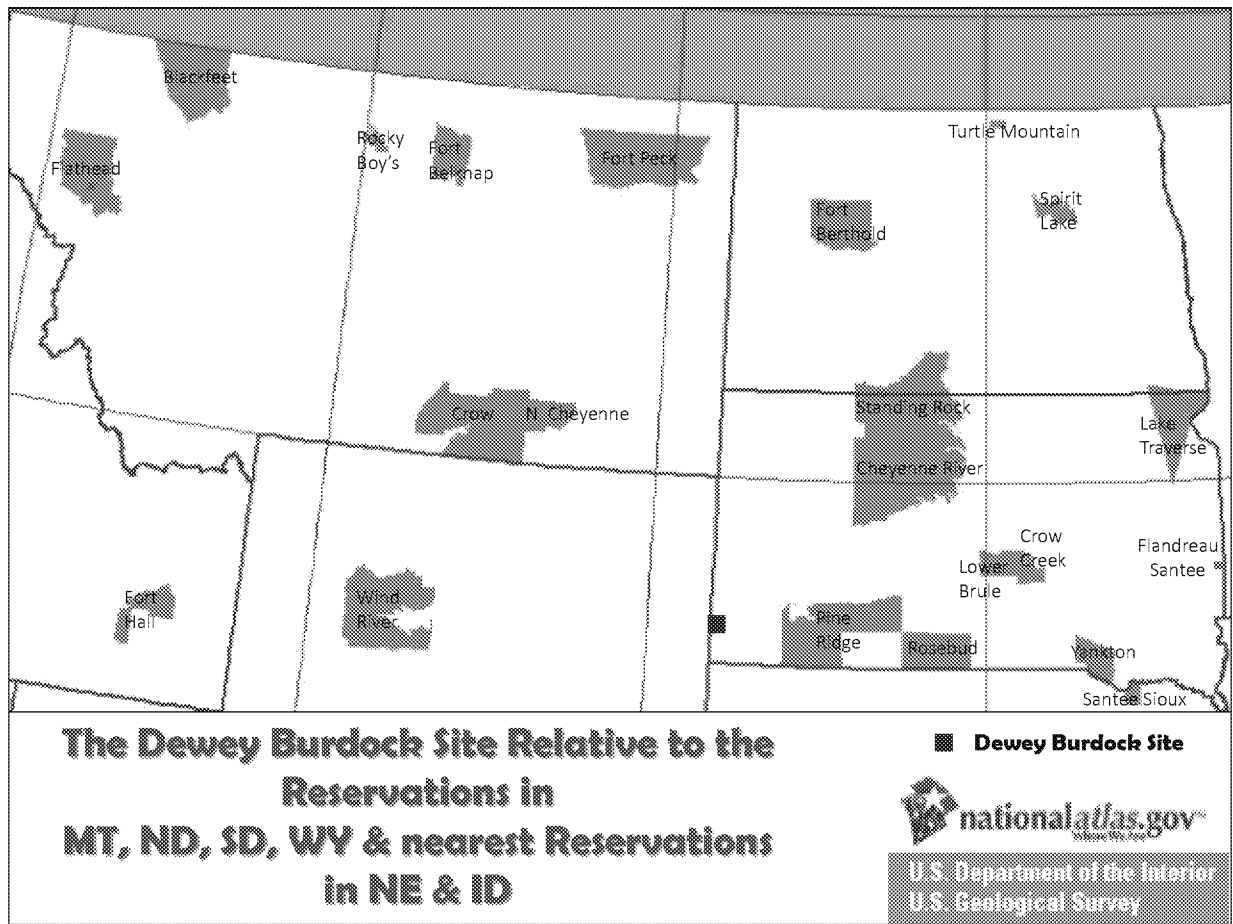
September 10, 2015, Bismarck meeting included THPOs from SD, ND and MT
Oklahoma Tribes include 1) Ponca, 2) Kiowa, 3) Apache, 4) Cheyenne & Arapaho.

Opportunities for Tribal Participation

Informal and Formal Government-to-Government Consultation

- Informal Opportunities:
 - Conference Calls or Web Conferences upon request
- Formal Opportunities:
 - Tribe may request formal consultation at any time.
- Participate in reviewing proposed permit and aquifer exemption decisions.
- Attend Public Hearings.
- Request additional informational web conferences.
- Request EPA to engage in community outreach.

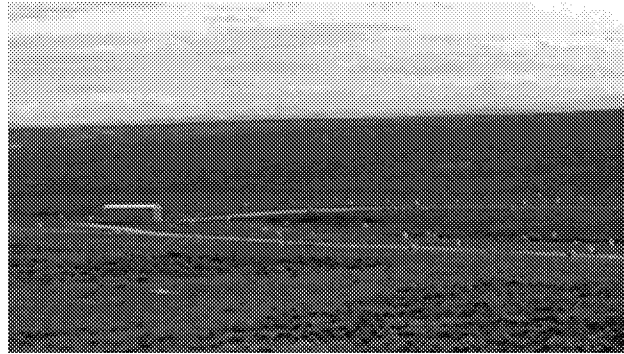




The Dewey Burdock site relative to the Reservations in MT, ND, SD, WY & nearest reservations in NE & ID

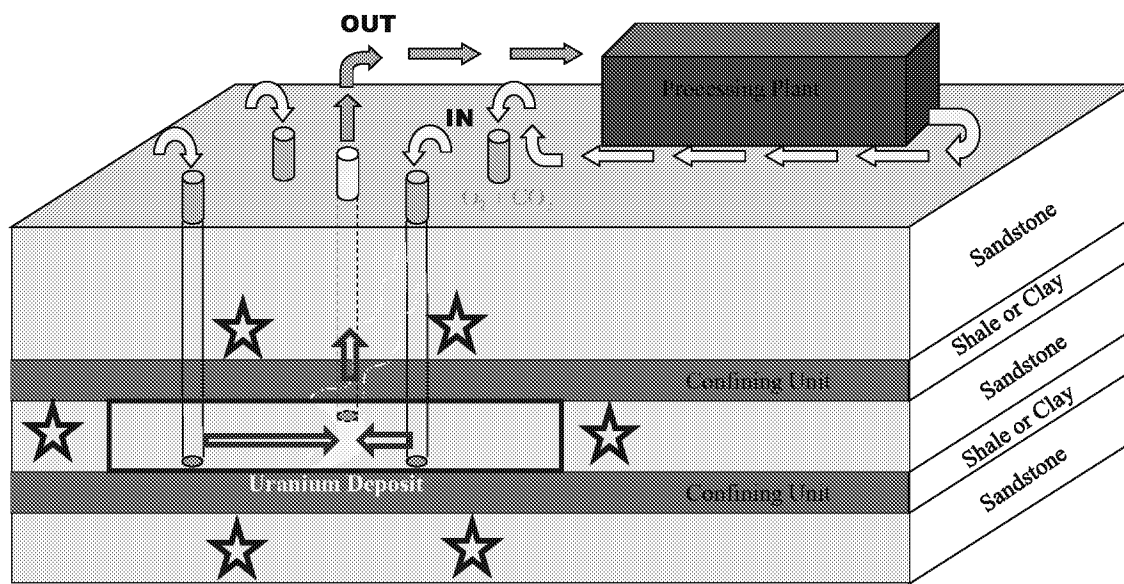
Dewey-Burdock Uranium In-Situ Recovery Site

- The Dewey-Burdock site will recover uranium using injection wells.
- There will be no open pits, underground mine workings or tailings piles.
- The uranium will be extracted from the ore deposit using an injected lixiviant.
- The uranium-bearing solution will be pumped to the surface using extraction wells.



Example of an In-Situ Uranium Recovery Site in WV

Uranium In-Situ Recovery Process



Typical five-spot pattern. In three dimensions, the wells follow the uranium deposit. Could be at different depths. Blue box represents aquifer exemption boundary – this boundary outlines an aquifer that currently does not meet U.S. drinking water standards.

Goal with restoration process after mining is to get this zone back to baseline water quality.

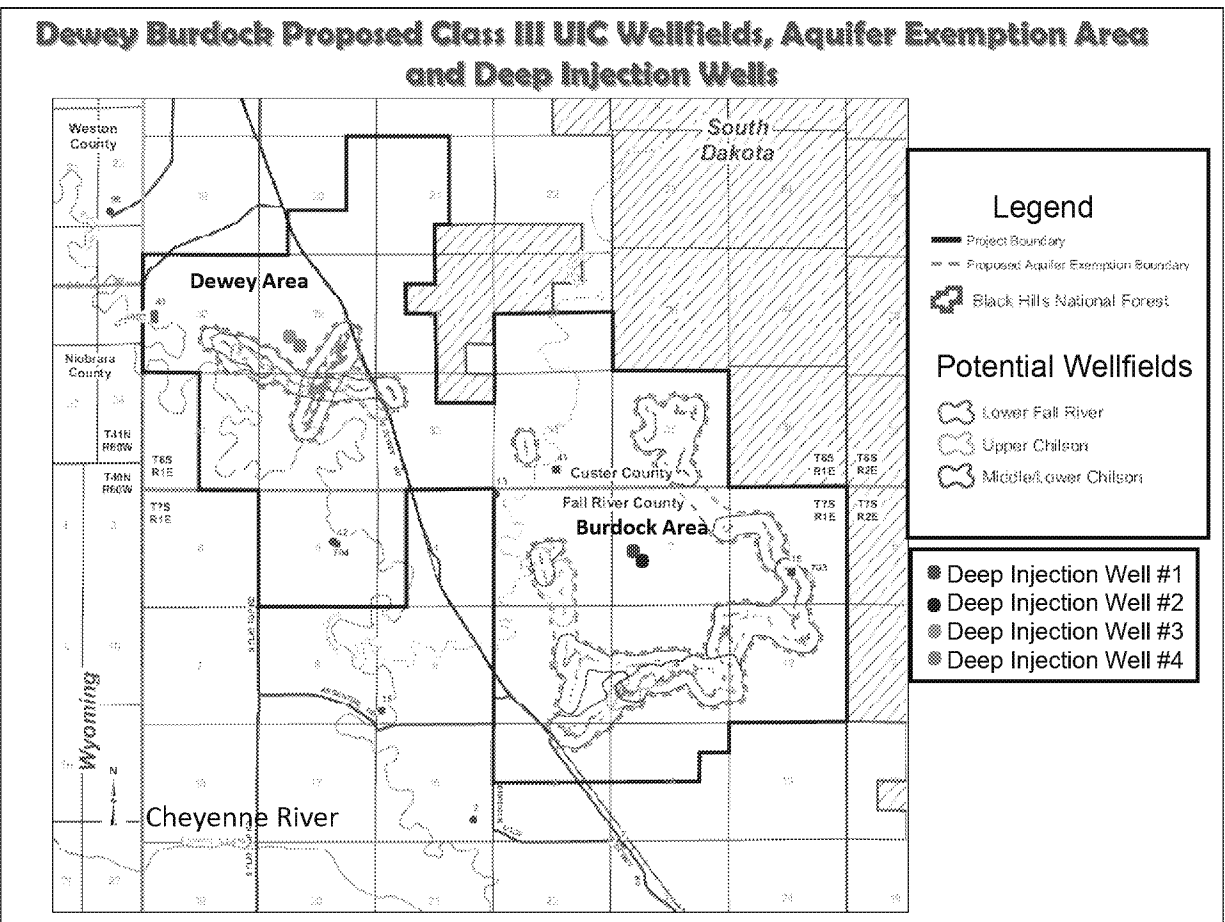
Stars represent monitoring wells where we do not want to see any change in water quality.

Other Regulatory Agencies at the Dewey-Burdock Site

- The Nuclear Regulatory Commission issued a License for the entire site.
- The South Dakota Department of Environment and Natural Resources has proposed issuance of a Large Mine Permit for the entire site.
- The BLM approved a Plan of Operations for portions of the site on BLM land.
- The South Dakota Department of Environment and Natural Resources has proposed issuance of a groundwater discharge permit for the land application of treated ISR waste fluids.

**The EPA Region 8 UIC Program
Has Received
Permit Applications
for Two Types of Injection Wells**

1. A Class III Permit Application for the injection of lixiviant to mobilize uranium in the ore bodies.
2. A Class V Permit Application for the disposal of treated ISR waste fluids into deep wells.



Point out
SD WY Border
Custer and Fall River Counties
Dewey Area & Burdock Area
4 proposed wellfield in Dewey Area & 10 proposed wellfields in the Burdock Area.

Regulatory Authority of the Underground Injection Control Program at the Dewey Burdock Site

The UIC Program is authorized under the Safe Drinking Water Act to protect *Underground Sources of Drinking Water* from contamination resulting from injection activities.

Underground source of drinking water (USDW) means an aquifer or part of an aquifer which supplies drinking water or contains fewer than 10,000 mg/l total dissolved solids.

Regulatory Authority of the Underground Injection Control Program at the Dewey Burdock Site

UIC Program regulations specify the following requirements for injection wells:

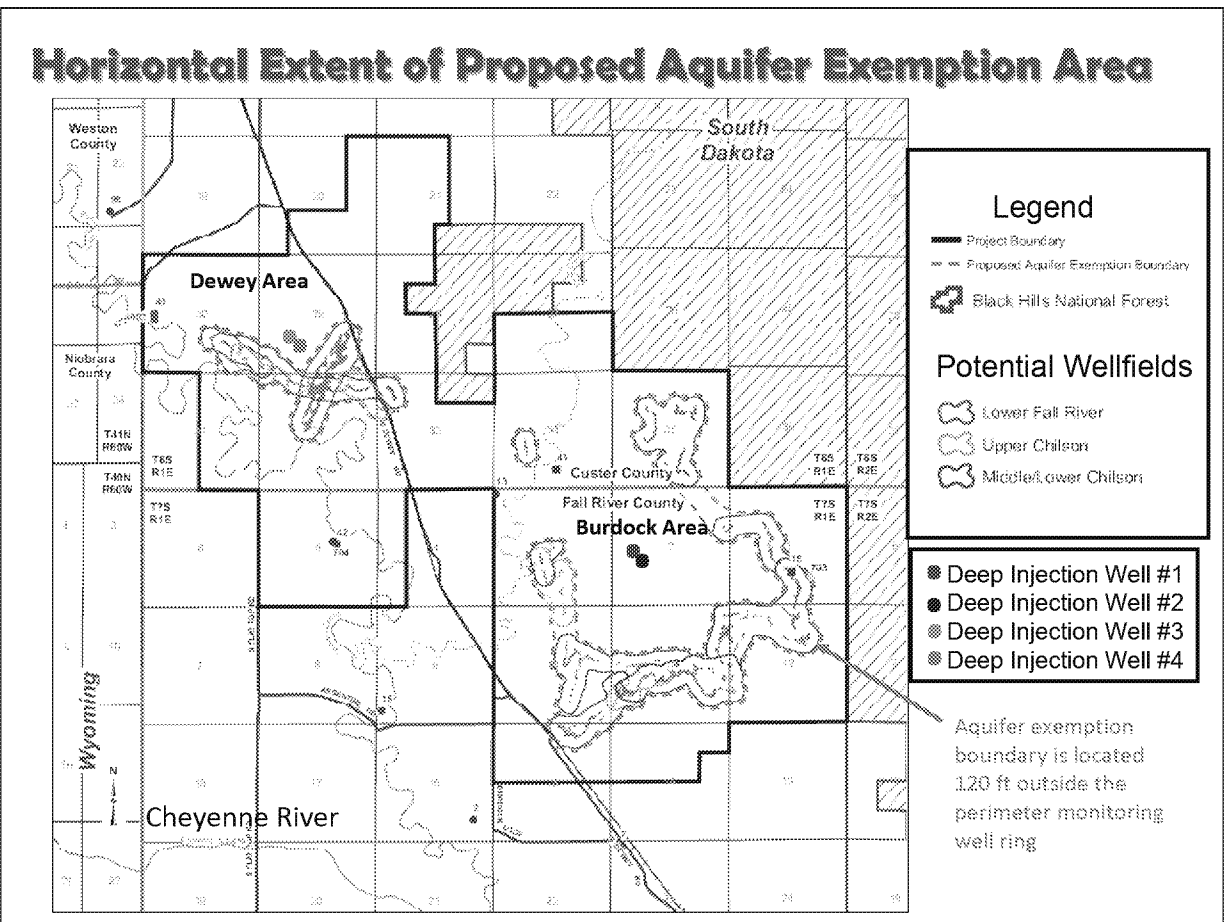
- construction,
- operation,
- monitoring,
- closure,
- financial assurance.

The EPA has been requested to Review an Aquifer Exemption

An Aquifer Exemption is required to inject into the Class III wells for uranium recovery.

An Aquifer Exemption is allowed under UIC regulations IF the USDW

1. Does not currently serve as a source of drinking water and
2. Is mineral producing or can be demonstrated to contain commercially producible minerals.



AE Boundary 120 feet outside of wellfield monitoring ring.

Point out:

SD WY Border

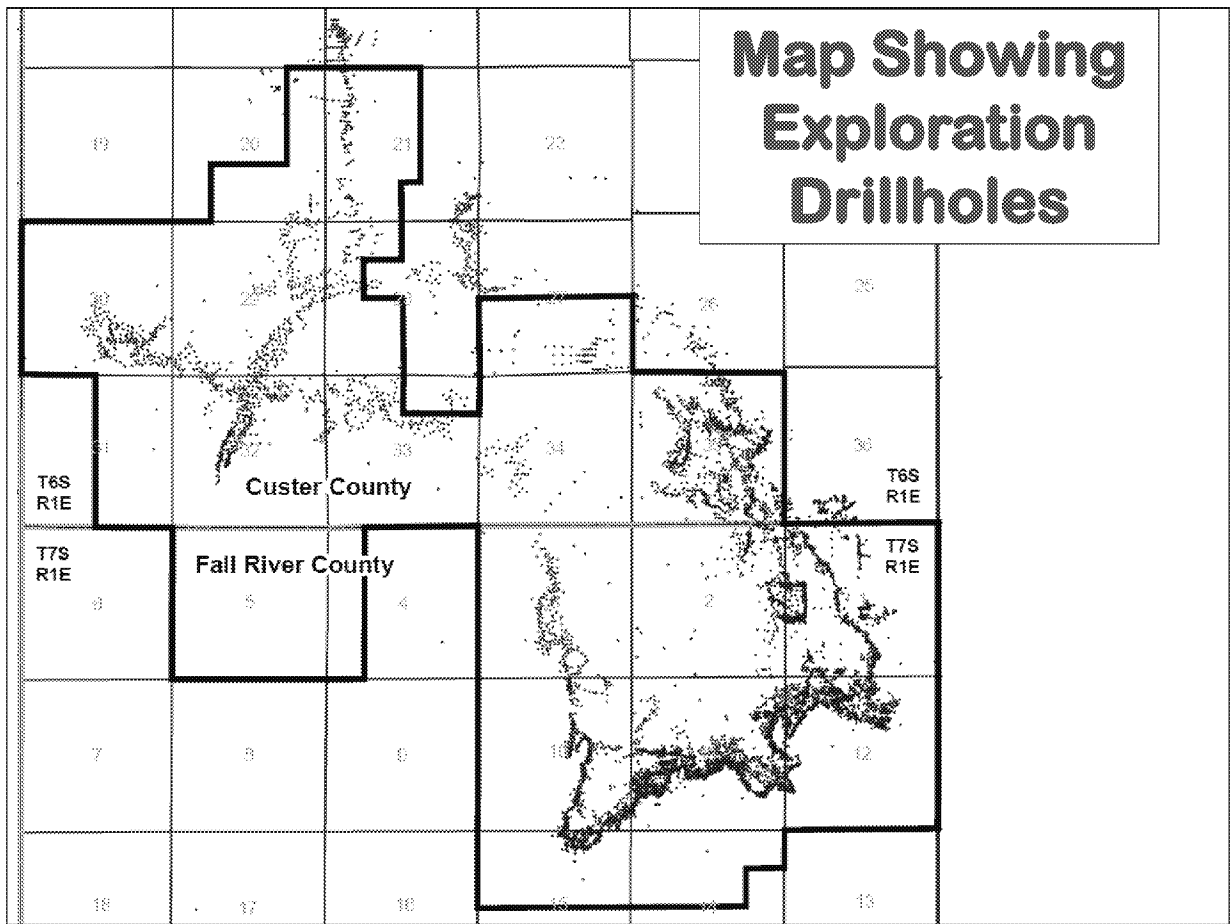
Custer and Fall River Counties

Dewey Area & Burdock Area

4 proposed wellfields in Dewey Area & 10 proposed wellfields in the Burdock Area.

UIC Regulations

- UIC regulations require the permittee to conduct considerable testing to provide EPA hydrogeological and other data before any injection wells are authorized to operate.
- The data must demonstrate vertical confinement to prevent movement of fluids out of the injection zone so that no USDWs are contaminated.
- The data must also demonstrate that it is possible to contain injection zone fluids horizontally to prevent contaminant migration into USDWs.



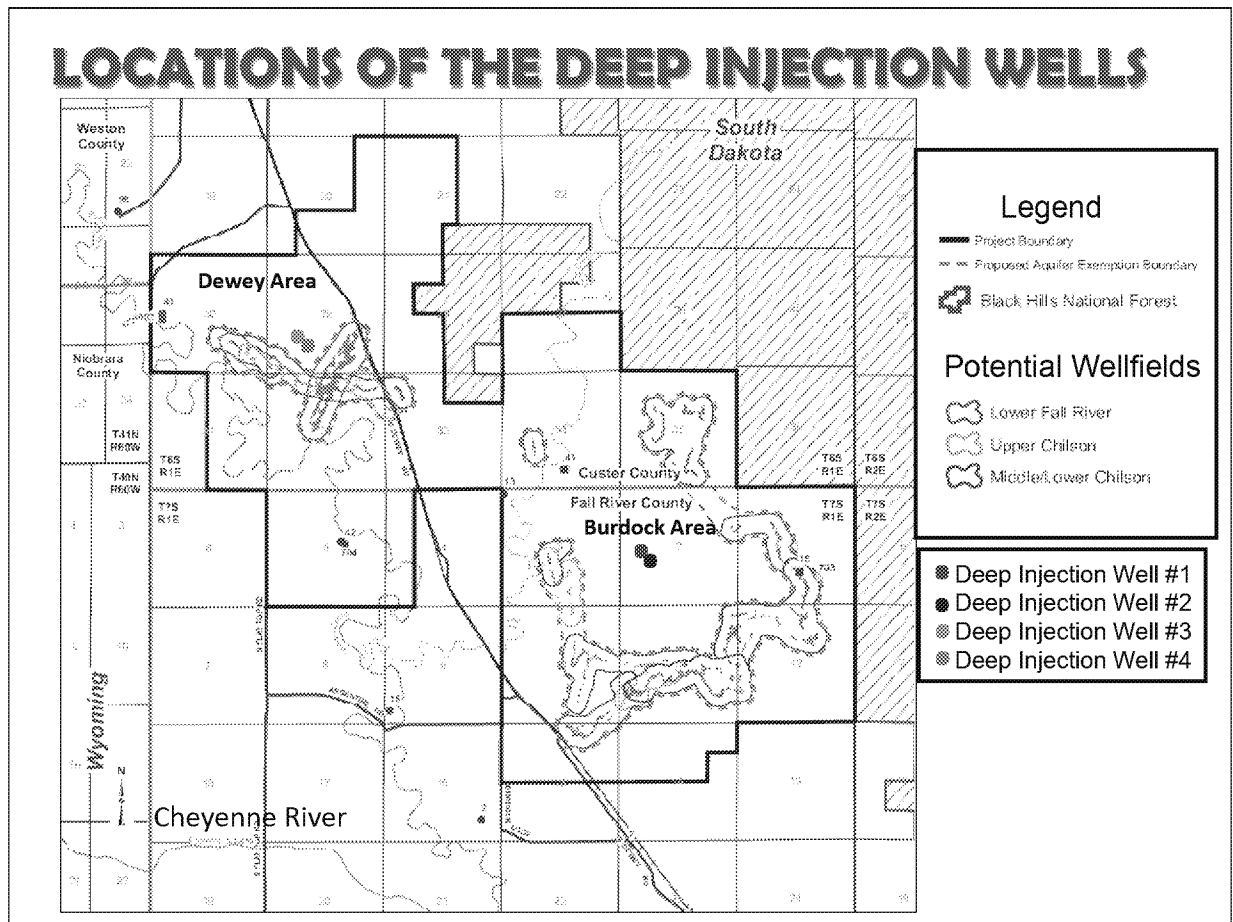
5932 drillholes 109 Powertech drilled

UIC Regulations

- UIC regulations require protection of USDWs around the AE area through extensive monitoring.
- UIC regulations require that no ISR process contaminants cross the aquifer exemption boundary during or after ISR operations.

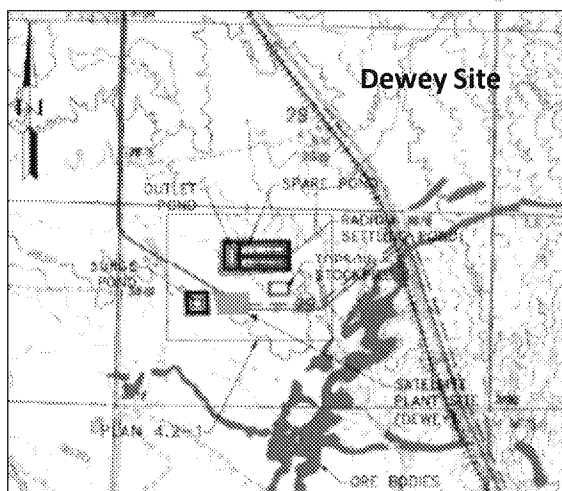
UIC Regulations

- UIC regulations authorize enforcement action when UIC regulations and/or permit conditions are violated.
- Enforcement actions can include requirements for groundwater remediation activities if appropriate.



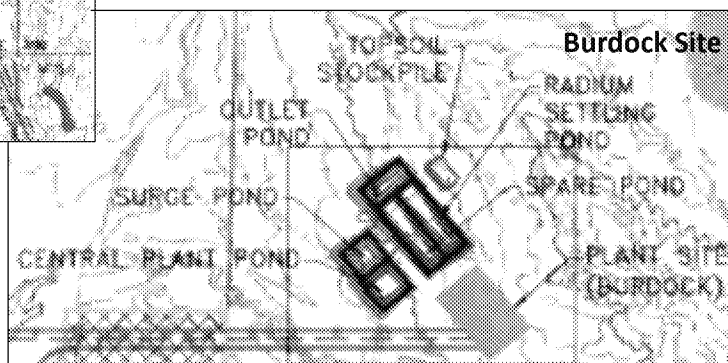
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Treatment and Storage Ponds for Deep Well Injectate



Waste fluids from the uranium recovery process will be treated in the radium settling ponds. After radium removal, the treated water will be stored in the outlet ponds and surge ponds. There will also be a spare radium treatment pond for backup. After treatment, the water will flow to the deep injection wells.

The Burdock Area central plant pond will store brine from the reverse osmosis treatment process used during groundwater restoration before the brine is treated in the radium settling ponds.



LOCATIONS OF THE DEEP INJECTION WELLS

The map displays the Black Hills National Forest area, including the Dewey Area and Burdock Area. It shows the locations of four deep injection wells (Well #1, Well #2, Well #3, and Well #4) and the boundaries of the project and the proposed aquifer exemption. The map also indicates the locations of the Lower Fall River, Upper Chilson, and Middle/Lower Chilson potential wellfields. The map includes a legend, a north arrow, and a scale bar.

Legend

- Project Boundary
- Proposed Aquifer Exemption Boundary
- Black Hills National Forest

Potential Wellfields

- Lower Fall River
- Upper Chilson
- Middle/Lower Chilson

Deep Injection Wells

- Deep Injection Well #1
- Deep Injection Well #2
- Deep Injection Well #3
- Deep Injection Well #4

Map Labels: Weston County, South Dakota, Niobrara County, T41N R69W, T46N R69W, T55 R1E, T56 R1E, T57 R1E, T58 R1E, T59 R1E, T60 R1E, T61 R1E, T62 R1E, T63 R1E, T64 R1E, T65 R1E, T66 R1E, T67 R1E, T68 R1E, T69 R1E, T70 R1E, T71 R1E, T72 R1E, T73 R1E, T74 R1E, T75 R1E, T76 R1E, T77 R1E, T78 R1E, T79 R1E, T80 R1E, T81 R1E, T82 R1E, T83 R1E, T84 R1E, T85 R1E, T86 R1E, T87 R1E, T88 R1E, T89 R1E, T90 R1E, T91 R1E, T92 R1E, T93 R1E, T94 R1E, T95 R1E, T96 R1E, T97 R1E, T98 R1E, T99 R1E, T100 R1E, T101 R1E, T102 R1E, T103 R1E, T104 R1E, T105 R1E, T106 R1E, T107 R1E, T108 R1E, T109 R1E, T110 R1E, T111 R1E, T112 R1E, T113 R1E, T114 R1E, T115 R1E, T116 R1E, T117 R1E, T118 R1E, T119 R1E, T120 R1E, T121 R1E, T122 R1E, T123 R1E, T124 R1E, T125 R1E, T126 R1E, T127 R1E, T128 R1E, T129 R1E, T130 R1E, T131 R1E, T132 R1E, T133 R1E, T134 R1E, T135 R1E, T136 R1E, T137 R1E, T138 R1E, T139 R1E, T140 R1E, T141 R1E, T142 R1E, T143 R1E, T144 R1E, T145 R1E, T146 R1E, T147 R1E, T148 R1E, T149 R1E, T150 R1E, T151 R1E, T152 R1E, T153 R1E, T154 R1E, T155 R1E, T156 R1E, T157 R1E, T158 R1E, T159 R1E, T160 R1E, T161 R1E, T162 R1E, T163 R1E, T164 R1E, T165 R1E, T166 R1E, T167 R1E, T168 R1E, T169 R1E, T170 R1E, T171 R1E, T172 R1E, T173 R1E, T174 R1E, T175 R1E, T176 R1E, T177 R1E, T178 R1E, T179 R1E, T180 R1E, T181 R1E, T182 R1E, T183 R1E, T184 R1E, T185 R1E, T186 R1E, T187 R1E, T188 R1E, T189 R1E, T190 R1E, T191 R1E, T192 R1E, T193 R1E, T194 R1E, T195 R1E, T196 R1E, T197 R1E, T198 R1E, T199 R1E, T200 R1E, T201 R1E, T202 R1E, T203 R1E, T204 R1E, T205 R1E, T206 R1E, T207 R1E, T208 R1E, T209 R1E, T210 R1E, T211 R1E, T212 R1E, T213 R1E, T214 R1E, T215 R1E, T216 R1E, T217 R1E, T218 R1E, T219 R1E, T220 R1E, T221 R1E, T222 R1E, T223 R1E, T224 R1E, T225 R1E, T226 R1E, T227 R1E, T228 R1E, T229 R1E, T230 R1E, T231 R1E, T232 R1E, T233 R1E, T234 R1E, T235 R1E, T236 R1E, T237 R1E, T238 R1E, T239 R1E, T240 R1E, T241 R1E, T242 R1E, T243 R1E, T244 R1E, T245 R1E, T246 R1E, T247 R1E, T248 R1E, T249 R1E, T250 R1E, T251 R1E, T252 R1E, T253 R1E, T254 R1E, T255 R1E, T256 R1E, T257 R1E, T258 R1E, T259 R1E, T260 R1E, T261 R1E, T262 R1E, T263 R1E, T264 R1E, T265 R1E, T266 R1E, T267 R1E, T268 R1E, T269 R1E, T270 R1E, T271 R1E, T272 R1E, T273 R1E, T274 R1E, T275 R1E, T276 R1E, T277 R1E, T278 R1E, T279 R1E, T280 R1E, T281 R1E, T282 R1E, T283 R1E, T284 R1E, T285 R1E, T286 R1E, T287 R1E, T288 R1E, T289 R1E, T290 R1E, T291 R1E, T292 R1E, T293 R1E, T294 R1E, T295 R1E, T296 R1E, T297 R1E, T298 R1E, T299 R1E, T300 R1E, T301 R1E, T302 R1E, T303 R1E, T304 R1E, T305 R1E, T306 R1E, T307 R1E, T308 R1E, T309 R1E, T310 R1E, T311 R1E, T312 R1E, T313 R1E, T314 R1E, T315 R1E, T316 R1E, T317 R1E, T318 R1E, T319 R1E, T320 R1E, T321 R1E, T322 R1E, T323 R1E, T324 R1E, T325 R1E, T326 R1E, T327 R1E, T328 R1E, T329 R1E, T330 R1E, T331 R1E, T332 R1E, T333 R1E, T334 R1E, T335 R1E, T336 R1E, T337 R1E, T338 R1E, T339 R1E, T340 R1E, T341 R1E, T342 R1E, T343 R1E, T344 R1E, T345 R1E, T346 R1E, T347 R1E, T348 R1E, T349 R1E, T350 R1E, T351 R1E, T352 R1E, T353 R1E, T354 R1E, T355 R1E, T356 R1E, T357 R1E, T358 R1E, T359 R1E, T360 R1E, T361 R1E, T362 R1E, T363 R1E, T364 R1E, T365 R1E, T366 R1E, T367 R1E, T368 R1E, T369 R1E, T370 R1E, T371 R1E, T372 R1E, T373 R1E, T374 R1E, T375 R1E, T376 R1E, T377 R1E, T378 R1E, T379 R1E, T380 R1E, T381 R1E, T382 R1E, T383 R1E, T384 R1E, T385 R1E, T386 R1E, T387 R1E, T388 R1E, T389 R1E, T390 R1E, T391 R1E, T392 R1E, T393 R1E, T394 R1E, T395 R1E, T396 R1E, T397 R1E, T398 R1E, T399 R1E, T400 R1E, T401 R1E, T402 R1E, T403 R1E, T404 R1E, T405 R1E, T406 R1E, T407 R1E, T408 R1E, T409 R1E, T410 R1E, T411 R1E, T412 R1E, T413 R1E, T414 R1E, T415 R1E, T416 R1E, T417 R1E, T418 R1E, T419 R1E, T420 R1E, T421 R1E, T422 R1E, T423 R1E, T424 R1E, T425 R1E, T426 R1E, T427 R1E, T428 R1E, T429 R1E, T430 R1E, T431 R1E, T432 R1E, T433 R1E, T434 R1E, T435 R1E, T436 R1E, T437 R1E, T438 R1E, T439 R1E, T440 R1E, T441 R1E, T442 R1E, T443 R1E, T444 R1E, T445 R1E, T446 R1E, T447 R1E, T448 R1E, T449 R1E, T450 R1E, T451 R1E, T452 R1E, T453 R1E, T454 R1E, T455 R1E, T456 R1E, T457 R1E, T458 R1E, T459 R1E, T460 R1E, T461 R1E, T462 R1E, T463 R1E, T464 R1E, T465 R1E, T466 R1E, T467 R1E, T468 R1E, T469 R1E, T470 R1E, T471 R1E, T472 R1E, T473 R1E, T474 R1E, T475 R1E, T476 R1E, T477 R1E, T478 R1E, T479 R1E, T480 R1E, T481 R1E, T482 R1E, T483 R1E, T484 R1E, T485 R1E, T486 R1E, T487 R1E, T488 R1E, T489 R1E, T490 R1E, T491 R1E, T492 R1E, T493 R1E, T494 R1E, T495 R1E, T496 R1E, T497 R1E, T498 R1E, T499 R1E, T500 R1E, T501 R1E, T502 R1E, T503 R1E, T504 R1E, T505 R1E, T506 R1E, T507 R1E, T508 R1E, T509 R1E, T510 R1E, T511 R1E, T512 R1E, T513 R1E, T514 R1E, T515 R1E, T516 R1E, T517 R1E, T518 R1E, T519 R1E, T520 R1E, T521 R1E, T522 R1E, T523 R1E, T524 R1E, T525 R1E, T526 R1E, T527 R1E

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UIC Permitting Process

- After issuance of any draft permit and aquifer exemption decisions, there will be a 60 day public review and comment period.
- Other reviews required in UIC permitting process:
 - *Endangered Species Act,*
 - *National Historic Preservation Act 106 consultation,*
 - *Environmental Justice Analysis,*
 - *Cumulative effects of construction and operation of injection wells.*
- The EPA will hold at least two public hearings in South Dakota.
- The EPA will conduct additional outreach in Tribal communities upon request.

National Historic Preservation Act

EPA's plans for addressing NHPA obligations:

- Consider the effects of the whole undertaking on historic properties, not just EPA-regulated activities.
- Consult with tribes (and others) during our review.
- Tribes possess special expertise in assessing eligibility of historic properties that possess religious and cultural significance.
- Seek Tribal input on identification of traditional cultural properties, determination of adverse affects and ways to mitigate the adverse affects.

EPA has the option of designating NRC as the lead for this process, or of conducting the review ourselves.

- The EPA is reviewing the historic properties information developed in the NRC process.
- This information is available to the public at <http://adams.nrc.gov/ehd>.

Ways in which Tribal Officials Can Be Involved in the UIC Permitting Process

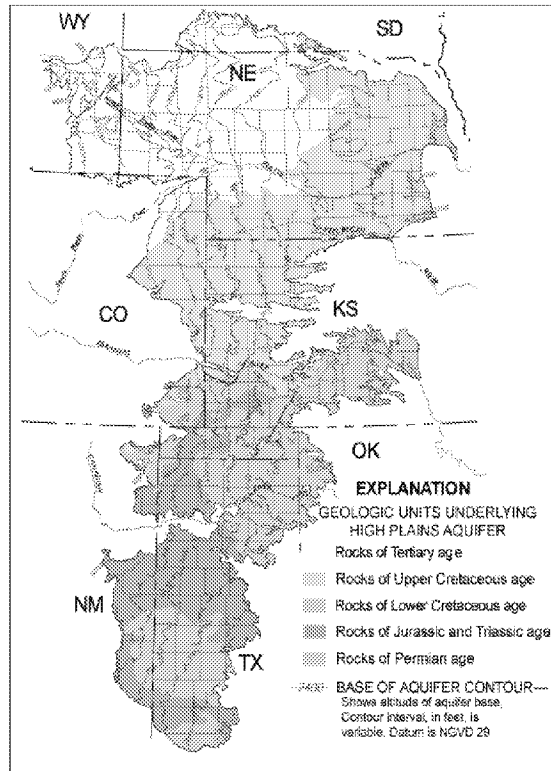
- Participate in informal and formal government to government consultation.
- Request informational web conferences on topics of concern.
- Participate in the review of the proposed permit and aquifer exemption decisions.
- Attend public hearings.

Provide info about requested web conferences to date, those conducted & those planned.

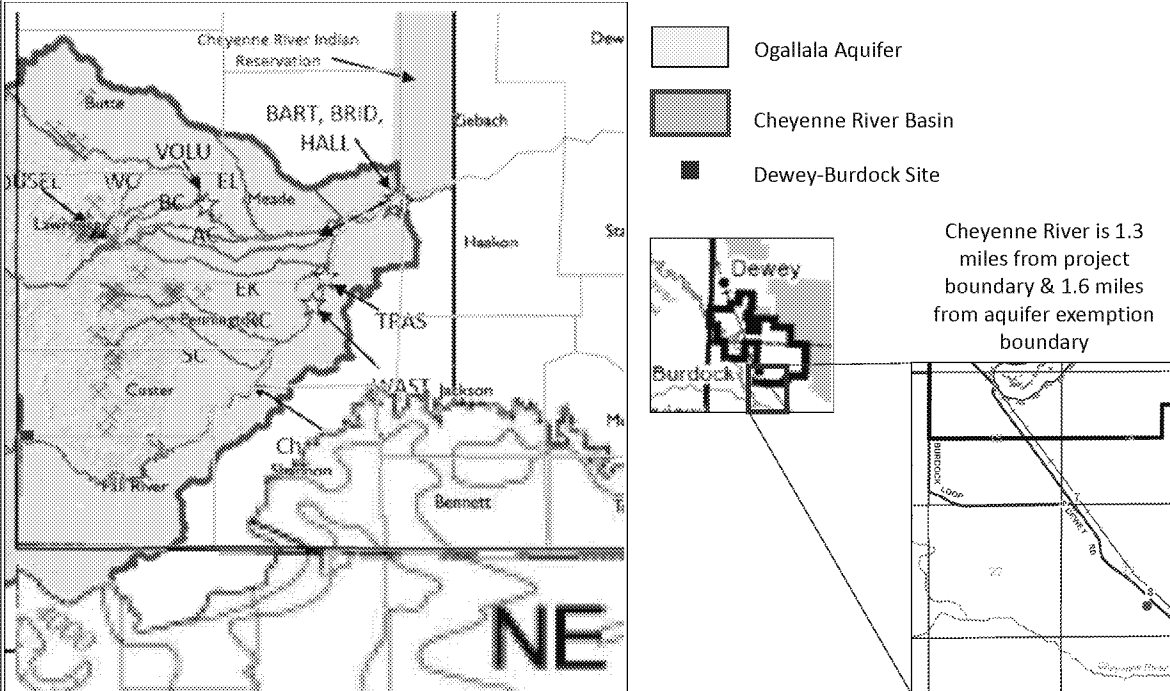
Issues Identified through Informal Consultation so far . . .

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater
- Impacts to surface water

Extent of the Ogallala Aquifer?

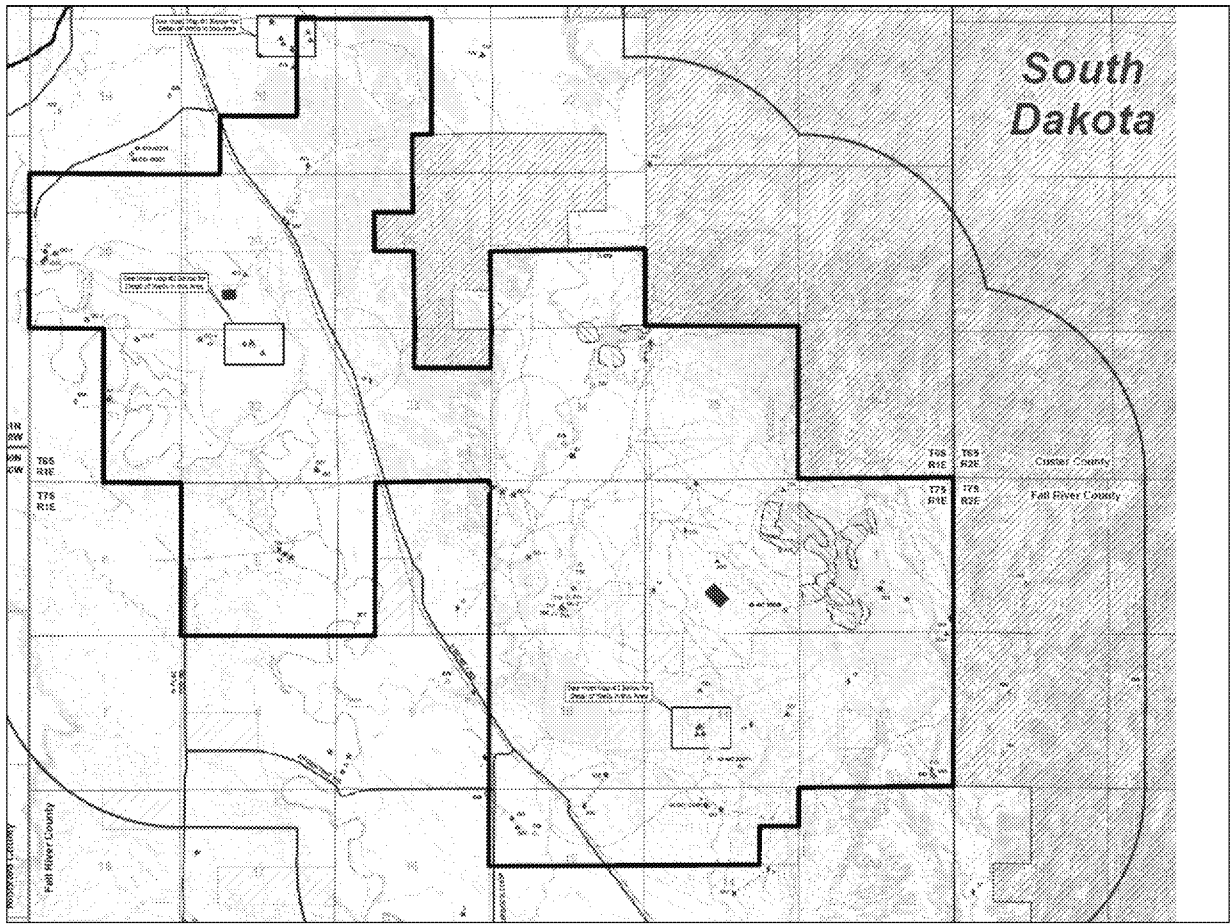


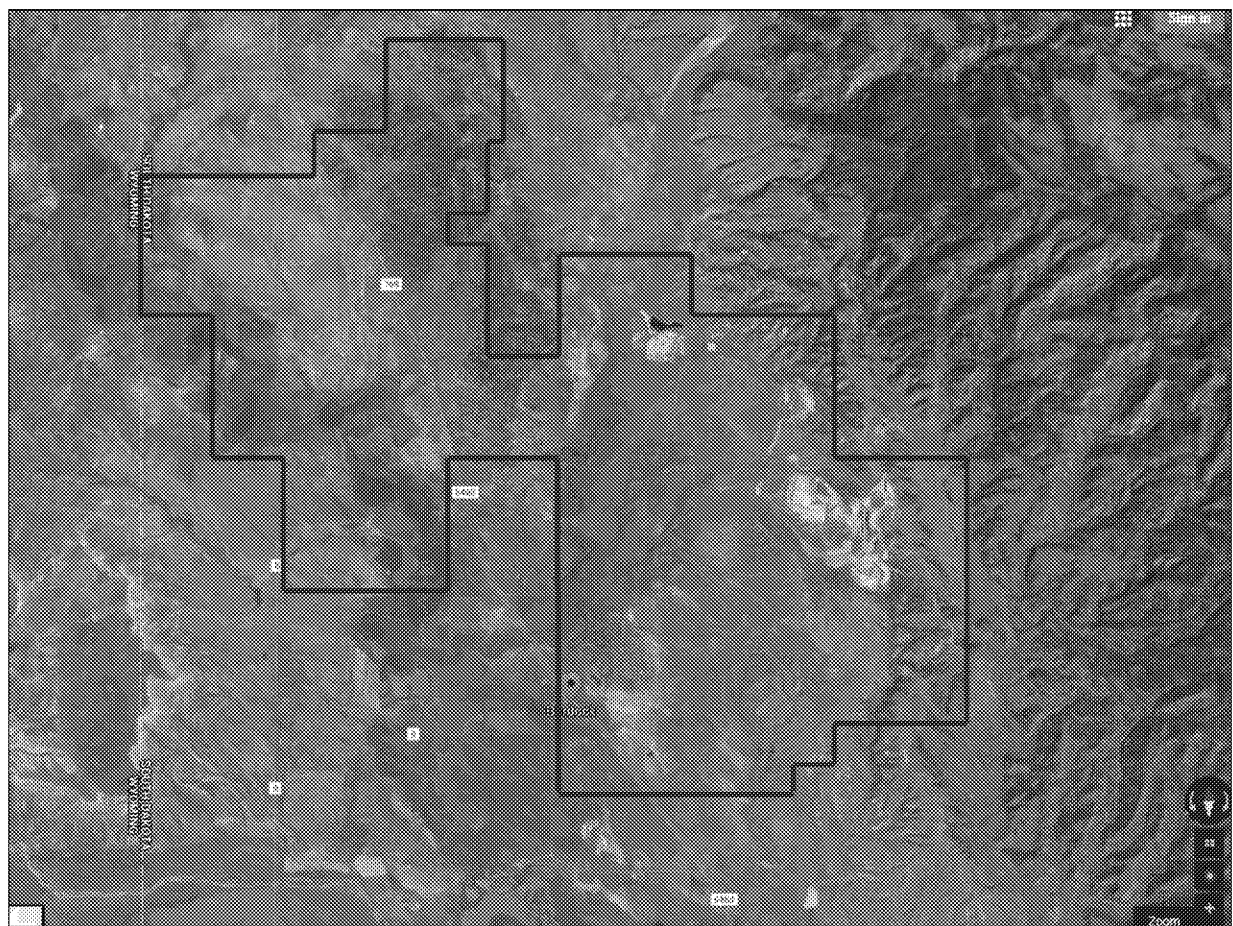
Will there be any impacts to the Ogallala Aquifer?



Issues Identified through Informal Consultation

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater
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Issues Identified through Informal Consultation

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- **Impacts to groundwater – very stringent permit requirements**
- Impacts to surface water

Issues Identified through Informal Consultation

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater
- Impacts to surface water – UIC area permit regulation requires the EPA to look at cumulative effects of the construction and operation of the additional injection wells.

Questions & Discussion

Contact Information

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Tribal Cultural Survey – Spring of 2013

Seven Tribes participated in the field survey at the proposed Dewey-Burdock site:

1. The Santee Sioux Tribe,
 2. The Northern Cheyenne Tribe,
 3. The Turtle Mountain Band of Chippewa Indians,
 4. The Crow Creek Sioux Tribe,
 5. The Cheyenne and Arapaho Tribes of Oklahoma,
 6. The Crow Nation, and
 7. The Northern Arapaho Tribe
- The tribal survey teams identified new artifact discoveries or cultural features of interest to Tribes at 24 previously reported archaeological sites, as well as 47 additional locations.
 - In total, the tribal survey teams identified and investigated 71 tribal sites.
 - These features include isolated artifact finds, animal bone concentrations, stone circles, cairns, and possible fasting sites.
 - 5 features were identified during the field survey as possible gravesites.